



Commercial Valve Troubleshooting Webinar

Harland Hirtzel, Product Manager

September 15, 2010

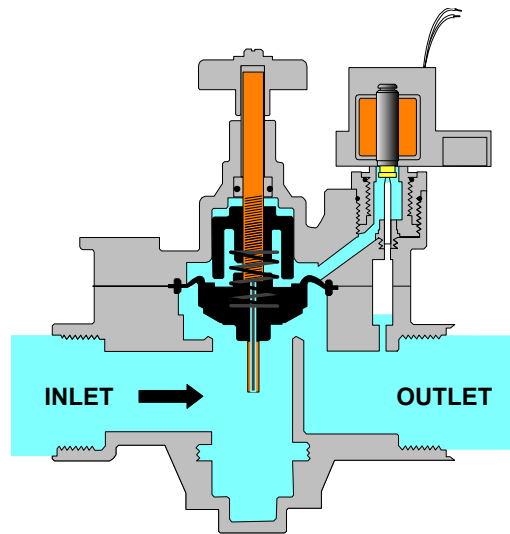
CONFIDENTIAL

FOR INTERNAL USE ONLY

September 15, 2010

Page 2

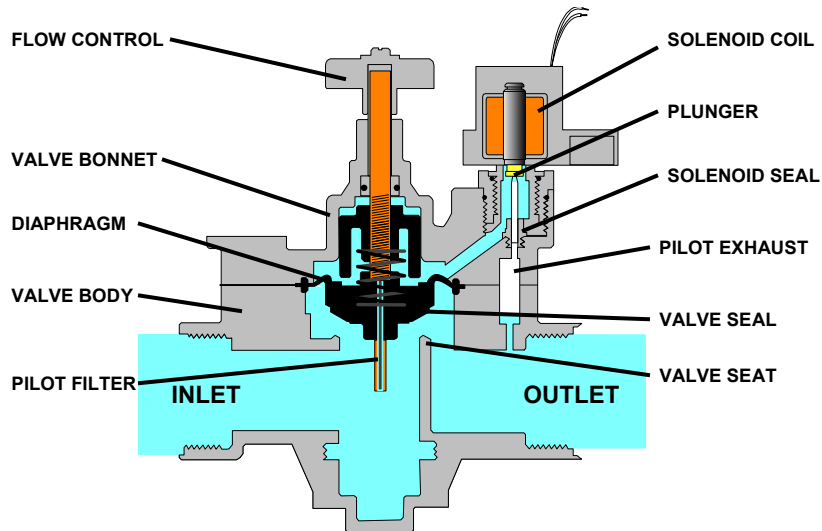
Valve Cross Sectional View



CONFIDENTIAL - FOR INTERNAL USE ONLY

© Rain Bird Corporation

Valve Components

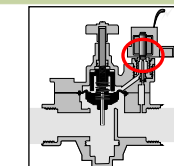
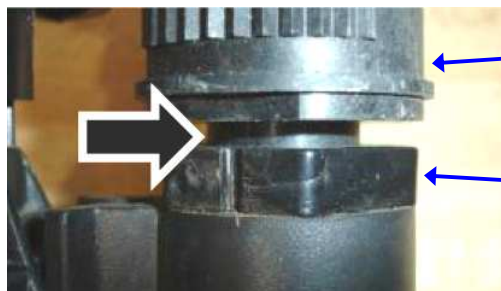


CONFIDENTIAL - FOR INTERNAL USE ONLY

© Rain Bird Corporation

No Close - Weeping Or Full Open Loose Solenoid

Example:
Gap Is Too Wide



Solenoid

Adapter

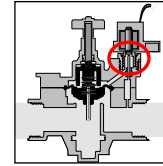
PROBLEM: The solenoid is not fully tightened. The pilot dump line will be constantly open which in turn keeps the valve open.

SOLUTION: Tighten the solenoid using the handle/wrench to "hand tight".

CONFIDENTIAL - FOR INTERNAL USE ONLY

© Rain Bird Corporation

No Close - Weeping Or Full Open Solenoid O-Ring Damage



Example:
O-ring is Nicked

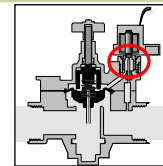


Solenoid O-Ring

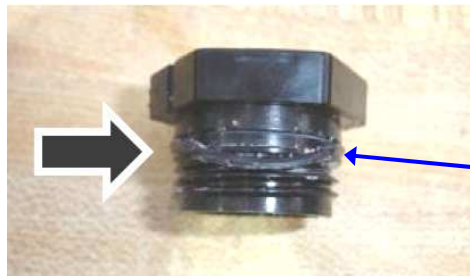
PROBLEM: The solenoid o-ring is damaged. Pilot is vented to atmosphere which allows the valve to stay open constantly or intermittently.

SOLUTION: Replace the o-ring or replace solenoid assembly.

No Close - Weeping Or Full Open Adapter O-Ring Damage



Example:
O-ring is Not
In Groove

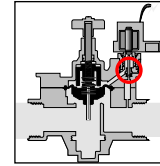


O-Ring

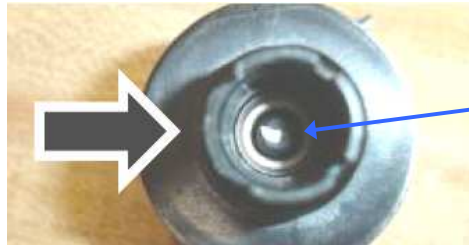
PROBLEM: The adapter o-ring is either damaged or installed improperly. The valve pilot is vented to atmosphere which allows the valve to stay open constantly or intermittently.

SOLUTION: Replace the o-ring or replace the adapter assembly.

No Close - Weeping Or Full Open Debris on Plunger Seal



Example:
Debris Has
Lodged In
Seal Face

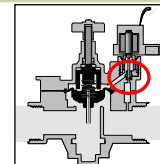


Plunger
Seal Face

PROBLEM: Debris has been deposited on the plunger seal face. The plunger cannot seal off the pilot dump hole which keeps the valve open.

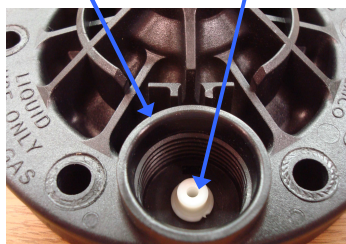
SOLUTION: Remove the plunger, rinse with water and reinstall. If seal has been damaged, replace the plunger or replace solenoid assembly.

No Close - Weeping Or Full Open Deformed Solenoid Seal



Solenoid
Bowl

Solenoid
Seal



Good Seal



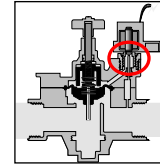
Damaged Seal



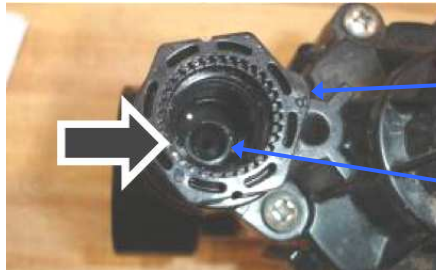
PROBLEM: The solenoid seal is damaged from over-tightening the solenoid assembly into the solenoid bowl. Even though the solenoid is de-energized, the valve stays open because the pilot exhaust is not sealed off.

SOLUTION: Replace the solenoid seal.

No Close - Full Open Missing Parts



Example:
Solenoid Seal
Is Missing



Solenoid
Adapter

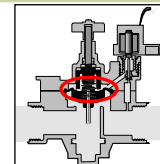
White Solenoid
Seal Should Be
Here

PROBLEM: Solenoid seal has been removed. The pilot dump hole cannot be closed and the valve runs full open continuously.

SOLUTION: Replace the solenoid seal.

Note: Also check for plunger, plunger retainer and spring.

No Close - Weeping Or Full Open Hole Or Crack in Diaphragm



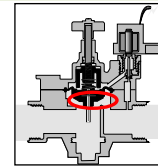
Example:
Debris Has
Cut Hole In
Diaphragm



PROBLEM: A hole in the diaphragm. On forward flow valves, this hole allows the pressure to equalize on both sides of the diaphragm and keeps the valve open.

SOLUTION: Replace the diaphragm assembly.

No Close - Weeping Or Full Open Debris on Plunger Seal



Example:
Rock Has
Been Wedged
In Valve Seal

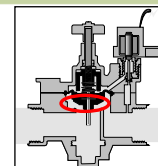


Valve Seal
Face

PROBLEM: Debris has been deposited on the valve seal. This blocks the valve from closing.

SOLUTION: Remove debris. If the valve seal (or seat) is damaged or distorted such, replace the entire diaphragm assembly.

No Close - Weeping Valve Seal Pop-Out



Example:
PEB Valve
Seal Has
Pulled Away
From Support



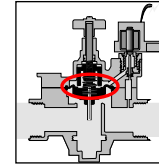
Seal

Seal Support

PROBLEM: The main valve seal is pulled away from its co-molded plastic support at high pressure and temperature. With the seal cocked to one side, the valve may weep intermittently. Difficult to diagnose because it can correct itself.

SOLUTION: Replace the diaphragm assembly.

No Close - Weeping Or Full Open Blocked Pilot Hole/Filter



Example:
Scale Buildup
Has Blocked
Pilot Hole

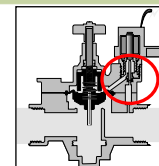


Diaphragm Assembly
Viewed From Top

PROBLEM: Debris or scale has blocked the diaphragm pilot hole and/or filter. This prevents the pressure from equalizing above and below the diaphragm such that it cannot close.

SOLUTION: Clean the diaphragm and filter or replace the entire diaphragm assembly.

No Open - Low Or No Flow Blocked/Restricted Pilot Holes



Bonnet



Body

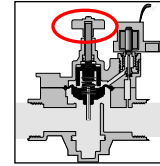


Probe

PROBLEM: Debris is blocking one or more of the pilot channels. The valve may only open partially or not at all depending on the severity of the restriction.

SOLUTION: Use a thin probe (e.g. paper clip) to clean out the debris. Check both the body and bonnet holes.

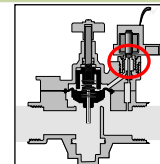
No Open - Low Or No Flow Flow Control Misadjusted



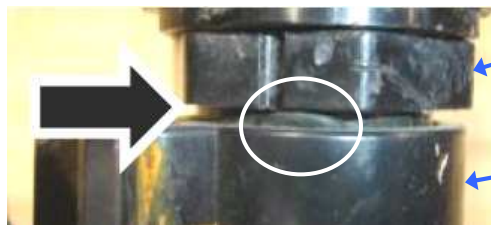
PROBLEM: The flow control has been manually closed or turned down so low that the valve “dithers”, i.e., cycles open and close quickly.

SOLUTION: Fully open the valve and then adjust flow downward until you reach the desired throw on your heads. Then back off ½ turn on the flow control.

Valve Leaks at Adapter Pinched O-Ring



Example:
O-Ring Has
Been Extruded
Out Of Bonnet



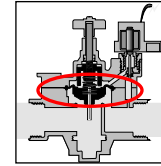
Adapter

Bonnet

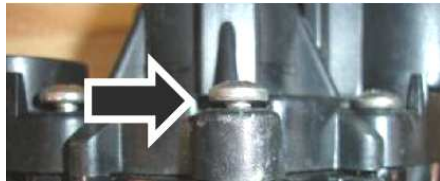
PROBLEM: The o-ring can be damaged if the adapter is not fully tightened into the valve bonnet. Then the o-ring cannot provide a good seal.

SOLUTION: Replace the o-ring or replace the entire adapter assembly.

Valve Leaks At Body-To-Bonnet Loose Bolts Or Nuts



PGA Valve



PEB Valve

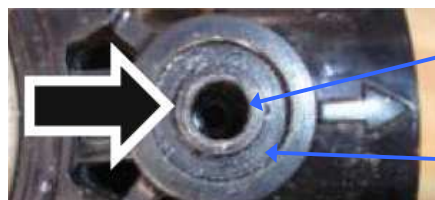
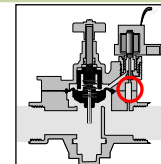


PROBLEM: The bonnet bolts (or nuts) are not fully tightened down. This results in a poor seal at the body-diaphragm-bonnet interface.

SOLUTION: Tighten down the bolts/nuts until the leak disappears.

Note: This is also a major cause of no-close symptoms.

Valve Leaks At Body-To-Bonnet Missing Exhaust Port O-Ring



Pilot Exhaust Port

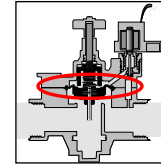
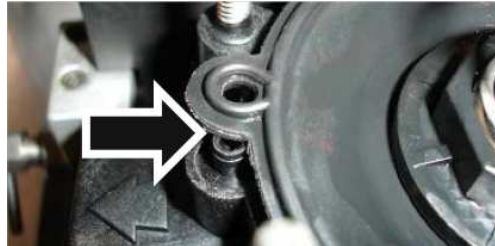
O-Ring Should
Be Here

PROBLEM: The o-ring seal between the bonnet and body for the pilot exhaust port is missing. It is sometimes unknowingly lost during servicing. This creates a sizable external leak.

SOLUTION: Replace the o-ring.

Note: Applies only to PGA Valves.

Valve Leaks At Body-To-Bonnet Misaligned Diaphragm Tab

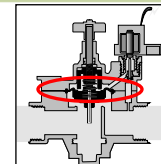


PROBLEM: The diaphragm tab is not lined up with the pilot exhaust port which prevents the diaphragm from sealing in that area. This results in a significant external leak.

SOLUTION: Install new diaphragm. Make sure the hole in the tab fits over the exhaust port.

Note: Applies only to PEB/PESB Valves.

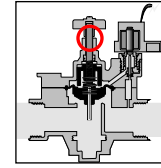
Valve Leaks At Body-To-Bonnet Misaligned Diaphragm



PROBLEM: The outer diaphragm bead has been crushed as a result of not being installed in the groove in the body. This results in a significant external leak.

SOLUTION: Install a new diaphragm taking care to make sure the diaphragm bead fits the body groove all the way around the circumference.

Valve Leaks At Stem Extruded O-Ring Seal

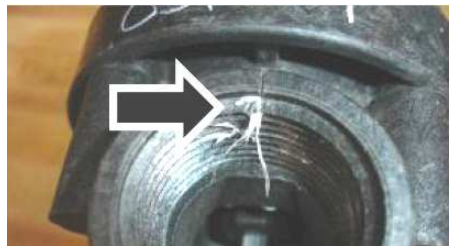
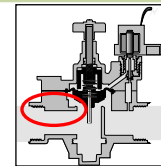


PROBLEM: The o-ring that seals the flow control stem extrudes out of the bonnet under pressure if misapplied. Water then leaks externally around the stem.

SOLUTION: Replace o-ring being careful to lubricate it first.

Note: Can also cause no-close symptoms.

Valve Leaks At Inlet Connection Cracked Body



PROBLEM: A stress fatigue crack starts at the highest stress concentration point inside the valve and propagates out through the threaded connection.

SOLUTION: Replace the valve.

Questions?

Thank You!